UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2003/00536

August 4, 2003

Mr. Fred P. Patron
Senior Transportation Planning Engineer
Federal Highway Administration, Oregon Division
530 Center Street NE
Salem, OR 97301

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on the Effects of the Highway 26 Zigzag to Rhododendron (Phase 2) Project, Sandy River Watershed, Clackamas County, Oregon

Dear Mr. Patron:

Enclosed is a biological opinion (Opinion) pursuant to section 7 of the Endangered Species Act (ESA) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries), on the effects of proposed Highway 26 Zigzag to Rhododendron (Phase 2) Project in Clackamas County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Lower Columbia River steelhead *(Oncorhynchus mykiss)* and Lower Columbia River chinook salmon *(O. tshawytscha)*. As required by section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the impact of incidental take associated with this action.

This document also serves as consultation on essential fish habitat for chinook and coho salmon pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and implementing regulations at 50 CFR Part 600.

If you have any questions regarding this consultation, please contact Art Martin of my staff in the Oregon Habitat Branch at 503.231.6848.

Sincerely,

for Michael R Course

D. Robert Lohn
Regional Administrator

cc: Molly Cary, ODOT
Diana Hwang, USFWS
Tom Murtagh, ODFW

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Highway 26 Zigzag to Rhododendron (Phase 2) Project,
Sandy River Watershed, Clackamas County, Oregon

Agency:	Federal Highway Administration
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	August 4, 2003
Issued by:	for Michael R Course _____ D. Robert Lohn Regional Administrator
Refer to:	**2003/00536**

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1. INTRODUCTION

1.1 Background

On March 13, 2002, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a request, including a biological assessment (BA), from the Federal Highway Administration (FHWA) for Endangered Species Act (ESA) section 7 formal consultation and Magnuson-Stevens Fishery Conservation and Management Act (MSA) essential fish habitat (EFH) consultation for the Highway 26 Zigzag to Rhododendron (Phase 1) Project in Clackamas County, Oregon. Subsequently, on May 1, 2002, NOAA Fisheries concluded formal consultation and issued a biological opinion and EFH consultation for Phase 1 of the Highway 26 Zigzag to Rhododendron project.

On May 8, 2003, NOAA Fisheries received a request, including a BA, from the FHWA for ESA section 7 formal consultation and MSA EFH consultation for the Highway 26 Zigzag to Rhododendron (Phase 2) Project in Clackamas County, Oregon. The Oregon Department of Transportation (ODOT) is the project applicant and the designated non-federal representative of the FHWA. The project is partially funded with FHWA dollars and constitutes the Federal nexus for section 7 formal ESA consultation. ODOT is responsible for the project design and construction management.

In the May 8, 2003, letter and BA, the FHWA determined that the following two listed evolutionarily significant units (ESUs) of Columbia Basin salmonids may occur within the project area: Lower Columbia River (LCR) steelhead (*Oncorhynchus mykiss*) and LCR chinook salmon (*O. tshawytscha*). Subsequently, the FHWA determined that the proposed action is "likely to adversely affect" (LAA) LCR steelhead and LCR chinook salmon. LCR steelhead were listed as threatened on March 19, 1998 (63 FR 13347) and LCR chinook salmon as threatened on March 24, 1999 (64 FR 14308). The FHWA determined the proposed action would also adversely effect EFH for chinook or coho salmon.

The objective of this consultation is to determine whether the proposed action is likely to jeopardize the continued existence of the two listed ESUs of Columbia Basin salmonids described above and to complete EFH consultation for chinook and coho salmon. This document is based on the information presented in the BA, site visits, meetings, and discussions with the Oregon Department of Fish and Wildlife (ODFW).

1.2 Proposed Action

The proposed action includes highway improvements along Highway 26 between the communities of Zigzag and Rhododendron. The project BA includes a set of conservation measures or best management practices (BMPs) designed to minimize adverse effects to steelhead, chinook salmon, and their habitats. These BMPs are described on pages 39-49 of the BA. Specific BMPs for erosion and sediment control, soil stabilization, pollution control, hazardous materials, in-water work, work area isolation, fish passage, fish rescue and salvage,

and other site-specific conservation measures are included. NOAA Fisheries regard these BMPs as integral components of the project and considers them to be part of the proposed action. All in-water work activities would occur during the standard in-water work timing guideline[1] of July 15 through August 31.

The purpose of the proposed action is to enhance traffic safety, increase highway capacity, improve access to the Woodlands neighborhood and other residences, and improve floodplain habitat conditions at the Zigzag River bridge.

Phase 2 of the project includes four major construction activities: (1) Highway widening and access modifications; (2) a full-spanning replacement of the Highway 26 bridge over the Zigzag River, including a floodplain restoration component; (3) a new full-spanning Woodlands access road bridge over Bear Creek just west of, and into, the Woodlands neighborhood; and (4) a stormwater collection and treatment system.

Direct and indirect effects to listed species may occur at the project site based on: (1) The potential for impairing fish passage; (2) change to stream hydraulics; (3) sediment and pollutant discharge; (4) risk of chemical contamination of the aquatic environment; and (5) the extent of riparian habitat modifications. As such, the action area for the proposed activities includes the immediate watershed where the proposed action will occur, and those areas upstream and downstream that may reasonably be affected, temporarily or in the long term. For the purposes of this Opinion, the action area is defined as the streambed, streambank, and riparian corridor of the Zigzag River, extending 5 meters (m) upstream above the confluence of Still Creek and the Zigzag River, throughout the project area, and downstream 800 m below the new Zigzag River bridge. The action area, for the purposes of this Opinion, also includes the streambed, streambanks, and riparian corridor of Bear Creek, extending upstream of the new Bear Creek bridge to the Highway 26 bridge crossing, throughout the project area, and downstream 800 m to its confluence with the Sandy River.

1.2.1 Highway Widening and Access Modifications

The 1.04 kilometer (km) segment of Highway 26 between the towns of Zigzag and Rhododendron (mile point 43.50 to mile point 44.15) will be widened to accommodate heavy traffic volumes and improve safety. The new highway segment will provide four 3.6 m wide travel lanes, a 4.2 m wide median, and 1.8 m wide shoulders for an average highway width of 22.2 m. The paved shoulder will increase by 0.6 m in width along portions of the new highway segment requiring placement of guardrails or concrete barriers. As a result of commitments by FHWA in the Mount Hood Highway Corridor Environmental Impact Statement (EIS) to avoid and minimize environmental impacts, the project has already minimized the increase of new highway width. Design changes associated with highway width minimization have resulted in

[1] Oregon Department of Fish and Wildlife, *Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources*, 12 pp (June 2000)(identifying work periods with the least impact on fish)(http://www.dfw.state.or.us/ODFWhtml/InfoCntrHbt/0600_inwtrguide.pdf).

various changes to the paved and graveled surface of the highway system at intersections, turnouts and frontage roads within the project segment. The proposed action will result in a net increase of 0.63 hectares (ha) of new impervious surface and a total of 2.83 ha of total impervious surface.

A total of 417 trees greater than 6-inch diameter breast height (dbh) would be removed from along the highway right of way as a result of the proposed widening. Of these, 115 would be removed from the functional Zigzag River riparian area (within 150 feet of the OHWM) and 22 would be from the functional Bear Creek riparian area. The proposed action includes the replanting of 332 trees along the highway right of way and 60 within the functional riparian areas.

1.2.2 Zigzag River Bridge Replacement

The proposed action includes replacement of the existing 53.34 m long, 8.53 m wide, two lane bridge at the Zizgag River bridge crossing with a longer, wider, four lane, full-spanning bridge. The new bridge will consist of a 76.2-m long, 23.4-m wide steel plate girder structure. The finished bridge would be supported with drilled shaft foundations and full-span the Zigzag River.

The existing bridge and instream piers (down to 0.45 m below the substrate elevation) would be removed from over, and within, the Zigzag River channel. Additionally, the new bridge design includes the removal of 23 linear m, 2,900 cubic m of concrete coated fill within and along the eastern bank of the Zigzag River. The new structure would essentially increase the functional width of Zigzag River floodplain by 23 linear m at the new bridge crossing. Class 1000 riprap would be needed along the new bridge abutments for scour protection. A 2.4 m deep, 1.2 m wide, and 6.3 m long toe trench would be excavated below the ordinary high water mark (OHWM) elevation and backfilled with the riprap. This scour protection design allows for the toe trench to be over excavated and top dressed with 0.45 m of native substrate to minimize potential long-term impacts to aquatic species. The overall volume of fill below the OHWM elevation associated with the scour protection measures would be 970 cubic m.

1.2.3 New Bear Creek Bridge

The proposed action includes a new bridge crossing over Bear Creek consisting of a 9.04 m long, 8.60 m wide pre-cast concrete structure. The finished bridge would be supported by drilled shaft, pin-pile, or other similar foundation and full-span Bear Creek. Additionally, the new bridge design includes the removal an abandoned gravel road, including 70 cubic m fill within and along the southern bank of the Bear Creek as enhancement of the Bear Creek floodplain. The floodplain enhancement is designed to essentially offset the functional impacts associated the construction of the new Bear Creek bridge. Class 100 riprap would be needed along the new bridge abutments for scour protection, but is only needed above the OHWM elevation of Bear Creek. The riprap would be top dressed with 0.3 m of native soils to minimize potential long-term impacts to aquatic species.

1.2.4 Stormwater Collection and Treatment System

The proposed action includes a stormwater treatment system composed of various engineered, partially-engineered, and non-engineered features and strategies to collect and treat stormwater runoff from most of the new impervious surfaces, existing impervious surfaces, and some of the surrounding developed areas within Rhododendron and east of the project along Highway 26. Stormwater runoff from 2.71 ha of new and existing impervious surfaces (the equivalent of 430% of the .63 ha of new impervious surface) will be collected and routed to the stormwater treatment system. The proposed stormwater treatment system makes extensive use of, and enhancement of, the favorable natural vegetation, topography and forest soils to collect and route stormwater runoff through non-engineered features to enhance the natural pollutant removal processes and increase infiltration potential. Engineered and partially-engineered features have been incorporated into the non-engineered treatment train where possible without causing destruction of riparian and forested uplands.

Water quality treatment features are designed or sized to provide pollutant removal for runoff from up to two thirds of the 2-year, 24-hour storm event at the minimum, or larger storm events where feasible. Sediment particles and associated pollutants are retained in various water quality treatment features up to, and including, coarse silts. Non-engineered water quality treatment strategies such as the trapping of sediment and heavy metals in settling basins, spreading stormwater over and through existing organic-rich and biologically active surface soils to promote degration and volitization of hydrocarbons, and the sheet flow of stormwater through extensive areas of densely vegetated riparian and upland areas to filter out pollutants are coupled with drain pipes, sumps, riprap lined ditches, and constructed detention basins to effectively route and treat stormwater runoff.

Non-engineered and engineered water quantity features include settling basins, sumps, flow dispersion berms, vegetated riparian and upland areas, natural upland forest swales and perched culvert crossings, and the two vegetated floodplain enhancement areas associated with the new bridges function to retain and detain flows. Water quantity treatment features and strategies are designed to collect and convey stormwater runoff through water quality treatment features to remove pollutants and then to and through water quantity treatment features that detain and infiltrate runoff to the maximum extent possible. The local Clackamas County surface water management rules require the project to release stormwater runoff from the 2-year, 24-hour storm under post-project conditions at a rate equivalent to or less than ½ the 2-year, 24-hour storm under pre-project conditions. Due to the favorable natural topography and high infiltration rates of native soils (>6 inches per hour), water quantity treatment features are expected to exceed requirements and infiltrate most of the stormwater runoff from the project from up to, and including, the 100-year, 24-hour storm event.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

Essential features of salmonid habitat required for the survival and recovery of listed species are water quality, water quantity, water temperature, water velocity, substrate, cover/shelter, food, space, and safe passage conditions (NMFS 1996). Together, these factors determine the biotic composition, structure, function, and stability of aquatic and riparian ecosystems and their ability to support the biological requirements of the species (Spence *et al.* 1996).

Pacific anadromous salmonid populations in the Pacific Northwest have evolved under the unimpaired flow regimes historically provided by their natal streams. The flow regimes reflect the dynamic character of fluvial systems, which is determined by the quantity, timing and natural variability of stream flow. These characteristics drive many of the physical processes in watersheds that are important to salmonid survival and conservation. Unimpaired flow regimes benefit salmonids in two critical ways: (1) They provide temporally and spatially appropriate water quantities to support specific life stages; and (2) they ensure self-sustaining ecosystem processes by which salmonid habitat is created and maintained over time.

Dynamic hydraulic, geomorphic, and ecologic processes must be maintained to provide salmonids a high probability of access to sufficient quantities of quality habitats for timely and successful completion of each and every life stage in freshwater (Bisson *et al.* 1997). However, given inter-annual hydrologic variability, even under an unimpaired flow regime, the quantity and quality of freshwater habitat necessary to obtain food and grow, escape predation, resist disease, migrate, and survive extreme environmental events is highly variable and can readily become limiting (Bjornn and Reiser 1991). Stream-rearing salmonids must survive extended periods in freshwater through winter and summer rearing bottlenecks (Bjornn and Reiser 1991). In addition, environmental conditions during extensive downstream and upstream migrations during juvenile and smolt life stages and again during adult and pre-spawning life stages can also significantly limit survival.

2.1.2 Evaluating Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. This analysis involves the initial steps of defining the biological requirements and current status of the listed species, and evaluating the relevance of the environmental baseline to the species' current status. Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and

(3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action. For the proposed action, NOAA Fisheries' jeopardy analysis considers direct or indirect mortality of fish attributable to the action.

2.1.3 Biological Requirements

The first step in the method NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmon is to define the biological requirements of the species most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species by taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list LCR steelhead and LCR chinook salmon for ESA protection and also considers new data available that are relevant to the determination.

The relevant biological requirements are those necessary for LCR steelhead and LCR chinook salmon to survive and recover to naturally-reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are habitat characteristics that function to support successful spawning, rearing and migration. These involve adequate fish passage, water quality, water quantity, substrate, shade and cover. Because the current status of the LCR steelhead and LCR chinook salmon, based upon their risk of extinction, has not significantly improved since the species were listed, adverse impacts to these biological requirements have the potential to be significant.

2.1.4 Environmental Baseline

Columbia River Watershed.
The most recent evaluation of the environmental baseline for the Columbia River is part of NOAA Fisheries' Opinion for the Federal Columbia River Power System (FCRPS) issued in December 2000. This Opinion assessed the entire Columbia River system below Chief Joseph Dam and downstream to the farthest point (the Columbia River estuary and nearshore ocean environment) at which listed salmonids are influenced. For a detailed evaluation of the environmental baseline of the Columbia River basin please refer to the FCRPS Opinion (NMFS 2000).

The quality and quantity of freshwater habitats in much of the Columbia River basin have declined dramatically in the last 150 years. Forestry, farming, grazing, road construction, hydrosystem development, mining, and urbanization have radically changed the historical habitat

conditions of the basin. Depending on the species, they spend from a few days to one or two years in the Columbia River and its estuary before migrating out to the ocean and another one to four years in the ocean before returning as adults to spawn in their natal streams.

Water quality in streams throughout the Columbia River basin has been degraded by human activities such as dams and diversion structures, water withdrawals, farming and grazing, road construction, timber harvest activities, mining activities, and urbanization. Tributary water quality problems contribute to poor water quality where sediment and contaminants from the tributaries settle in mainstem reaches and the estuary. Temperature alterations also affect salmonid metabolism, growth rate, and disease resistance, as well as the timing of adult migrations, fry emergence, and smoltification. Many factors can cause high stream temperatures, but they are primarily related to land-use practices rather than point-source discharges. Loss of wetlands and increases in groundwater withdrawals have contributed to lower base-stream flows, which in turn contribute to temperature increases. Channel widening and land uses that create shallower streams also cause temperature increases.

Pollutants also degrade water quality. Salmon require clean gravel for successful spawning, egg incubation, and emergence of fry. Fine sediments clog the spaces between gravel and restrict the flow of oxygen-rich water to the incubating eggs. Excess nutrients, low levels of dissolved oxygen, heavy metals, and changes in pH also directly affect the water quality for salmon and steelhead.

Sandy River Watershed.
The Sandy River Watershed is a southern tributary of the Columbia River, on the west side of Oregon's Cascade Mountains. For the purposes of fish management, the Sandy River Watershed is divided into the upper and lower Sandy River basins by Marmot Dam. The upper Sandy River basin is managed as a wild fish preserve with no hatchery fish releases or adult hatchery passage into the Sandy River above Marmot Dam. The upper Sandy River Watershed originates from the Sandy, Zigzag, and Reide Glaciers on the west slope of Mt Hood. From the headwaters, the upper Sandy River Watershed flows through several volcanic debris flows before entering the lower Sandy River Watershed.

Zigzag River.
The Zigzag River is a tributary of the upper Sandy River watershed at RM 42.8. The Zigzag River is comprised of several tributaries that originate at various elevations and are influenced by both rain on snow and glacial runoff. The dominant land uses in the Zigzag River watershed are Federal forest lands and to lesser degree, private forest lands and rural development.

Bear Creek
Bear Creek is a tributary of the upper Sandy River Watershed at RM 42.3. Bear Creek flows across the surface of a 1500-year old volcanic mudflow. The dominant land uses in the Bear Creek watershed are Federal forest lands and to lesser degree, private forest lands and rural development.

The Zigzag River and Bear Creek, within the action area, have degraded habitat resulting from forestry practices, rural development, draining and filling of wetlands, and the construction and maintenance of the state, county, and local transportation infrastructure which drastically altered the natural drainage system. The large woody debris, off-channel habitat, and pool frequency habitat indicators are *not properly functioning* within the action area because of chronic habitat degradation. In addition, the following environmental baseline indicators are *at risk*: subpopulation characteristics, temperature, sediment/turbidity, chemical contamination/nutrients, physical barriers, substrate, pool quality, streambank condition, refugia, floodplain connectivity, changes to peak/base flows, disturbance history and riparian reserves.

Based on the best available information on the current status of LCR steelhead and LCR chinook salmon range-wide; the population status, trends, and genetics; and the poor environmental baseline conditions within the action area, NOAA Fisheries concludes that the biological requirements of LCR steelhead and LCR chinook salmon within the action area are not currently being met. Actions that do not maintain or restore properly functioning aquatic habitat conditions would be likely to jeopardize the continued existence of LCR steelhead and LCR chinook salmon.

2.1.5 Analysis of Effects

2.1.5.1 Effects of Proposed Action

Creeks and rivers are dynamic systems that naturally alter their courses in response to many physical processes. Roadways and other structures constructed along waterways are subject to flooding, undercutting, and bedload deposition as a result of these natural changes in the stream course. Structural hardening of embankments is the traditional means of protecting these structures along waterways. Structural hardening limits natural fluvial processes resulting in impacts to the waterway.

Fish habitats are enhanced by the diversity of habitats at the land-water interface and adjacent bank (USACE 1977). Dynamic interaction of discharge, bedload transport, and geomorphology create and maintain diverse salmonid habitats within the action area and streamside vegetation provides shade that reduces water temperature. Overhanging branches provide cover from predators. Insects and other invertebrates that fall from overhanging branches may be preyed upon by fish, or provide food sources for other prey organisms. Immersed vegetation, logs, and root wads provide points of attachment for aquatic prey organisms, shelter from swift currents during high flow events, retain bedload materials, and reduce flow velocity.

Both the Zigzag River and Bear Creek channel currently run adjacent to the hardened highway prism or through multiple hardened bridge crossings. The full-spanning replacement bridge and floodplain enhancement will allow natural hydraulic processes (such as sediment transport, riparian re-vegetation, and large woody debris accumulation) to create and maintain complex fish habitats in and along the Zigzag River channel. The new Bear Creek bridge will restrict hydraulic processes at greater than the two-year runoff event and the Bear Creek floodplain

enhancement efforts are to, in part, offset any potential loss of function (such as sediment transport, riparian re-vegetation, and large woody debris accumulation) and to provide greater interaction between Bear Creek and its floodplain during larger runoff events, enhancing off channel refugia habitat for listed salmonids.

Sedimentation.
Potential impacts to listed salmonids from the proposed action include both direct and indirect effects. Potential direct effects include mortality from exposure to suspended sediments (turbidity) and contaminants resulting from bedload dredging activities. Potential indirect effects include behavioral changes resulting from elevated turbidity level (Sigler *et al.* 1984, Berg and Northcote 1985, Whitman *et al.* 1982, Gregory 1988), during river bank habitat alterations.

Suspended sediment and turbidity influences on fish reported in the literature range from beneficial to detrimental. Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorus fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the frequency and the duration of the exposure, not just the TSS concentration.

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Birtwell *et al.* 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (Sigler *et al.* 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potentially positive reported effect is providing refuge and cover from predation (Gregory and Levings 1988).

Fish that remain in turbid, or elevated TSS, waters experience a reduction in predation from piscivorus fish and birds (Gregory and Levings 1998). In systems with intense predation pressure, this provides a beneficial trade off (*e.g.*, enhanced survival) to the cost of potential physical effects (*e.g.*, reduced growth). Turbidity levels of about 23 Nephalometric Turbidity Units (NTU) have been found to minimize bird and fish predation risks (Gregory 1993). Exposure duration is a critical determinant of the occurrence and importance of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids may be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, research shows that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Turbidity, at moderate levels, has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile fish, and may also interfere with feeding (Spence *et al.* 1996). Newly-emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine, redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser 1991).

Excavation in the stream channel associated with the construction of the new bridge and the removal of the old bridge, floodplain enhancement activities and other earth work in and along the Zigzag River and Bear Creek may elevate the risk for turbidity and sediment transport within the action area. Because the potential for turbidity should be localized and brief, the probability of direct mortality is negligible. In-water work timing during the preferred in-water work timing period of July 15 through August 31, work area isolation, and fish removal would be employed as necessary, depending on presence of fish and/or flowing water to minimize the risk from turbidity and sediment transport during in-water work activities.

Chemical Contamination.
As with all construction activities, accidental release of fuel, oil, uncured concrete, and other contaminants may occur. Operation of the back-hoes, excavators, and other equipment requires the use of fuel, lubricants, *etc.*, which, if spilled into the channel of a waterbody or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants (such as fuel, oil, and some hydraulic fluids) contain poly-cyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985). Similarly, exposure to herbicides can have lethal and sublethal effects on salmonids, aquatic invertebrates, aquatic vegetation, and target and non target riparian vegetation (Spence *et al.* 1996).

Excavation in the stream channel associated with the construction of the new bridge, and the removal of the old bridge, floodplain enhancement activities at the Zigzag River crossing, and upland earth work associated with the rest of the proposed action adjacent to the Zigzag River and Bear Creek will elevate the risk for chemical contamination of the aquatic environment within the action area. Because the potential for chemical contamination should be localized and brief, the probability of direct mortality is negligible. In-water work timing during the preferred in-water work timing period of July 15 through August 31, work area isolation, and fish removal would be employed as necessary, depending on presence of fish and/or flowing water to minimize the risk from chemical contamination during in-water work activities. The contractor would also be required to develop, implement and monitor a site specific pollution control plan in an effort to further minimize risk to the aquatic environment.

Fish Rescue, Salvage and Relocation.
As a result of the proposed action, specifically the in-water work associated with construction of the new Zigzag River bridge and demolition of the existing Zigzag River bridge, potential direct handling of listed salmonids during work area isolation and fish removal may occur. Direct and delayed mortality of LCR steelhead and LCR chinook salmon from capture and relocation stress may occur during fish removal and salvage efforts. NOAA Fisheries anticipates it may not be possible to capture and relocate all of the individual fish within the isolated work area depending on site condition during the isolation of the in-water work area. Any individual LCR steelhead or LCR chinook salmon remaining within the isolated work area after fish removal and salvage has been attempted, would be subject to considerable incidental harassment and stress, potentially, resulting in lethal incidental take.

Water Quality Stormwater Effects.
The potential exists for an increase in runoff, high in pollutants, into the Zigzag River and Bear Creek from the proposed 0.63 ha of new impervious surface (Booth and Jackson 1997). However, the proposed stormwater runoff treatment system will more than offset any potential increase in adverse effects to water quality as a result of the proposed action. The proposed stormwater treatment system will treat stormwater runoff from up to 2.71 ha of new and existing impervious surfaces. This stormwater treatment system includes construction of a various engineered and non-engineered features designed to remove TSS, heavy metals, oil, grease, and hydrocarbons from storms up to and including the water quality storm event. The treated stormwater will then discharge into water quantity treatment facilities and/or existing riparian and upland areas before entering the Zigzag River or Bear Creek channel. The proposed project is expected to avoid any potential adverse effects on water quality in the Zigzag River and Bear Creek in the long term.

Hydrologic Stormwater Effects.
The potential exists for reduced evapotransporation and infiltration opportunities resulting in increase the magnitude and duration of peak discharge and decrease summer base flow from the proposed 0.63 ha of new impervious surface (Booth and Jackson 1997). However, the proposed stormwater runoff treatment system will more than offset any potential adverse effects to hydrology from the proposed action.

This stormwater treatment system includes construction of inline engineered and non-engineered features designed to fully infiltrate a majority of the stormwater runoff from up to 2.71 ha of new and existing impervious surfaces. All stormwater runoff that has not been fully infiltrated or evapotransporated in the stormwater treatment system will discharged into existing riparian areas or the floodplain enhancement areas before entering the Zigzag River or Bear Creek channel. The balance of pre-project evapotransporation, infiltration and discharge rates compared with post-project rates will likely result in no net increase in magnitude or duration of peak discharge from stormwater runoff into the Zigzag River or Bear Creek and will avoid any potential adverse effect to summer baseflow contribution in the Zigzag River as measured by the Zigzag River's annual hydrograph within the action area. NOAA Fisheries expects potential long-term

beneficial effects in Bear Creek from potential increased contribution to summer base flow in Bear Creek as measured by Bear Creek's annual hydrograph within the action area.

Riparian Vegetation.
Woody riparian vegetation provides large wood to the stream, which encourages the creation of rearing and spawning areas. Riparian vegetation also provides water quality functions (*e.g.* temperature control and nutrient transformation), bank stability, detritus (insect and leaf input, small wood for substrate for insects, *etc.*), microclimate formation, floodplain sediment retention and vegetative filtering, and recharge of the stream hyporheic zone. The removal of 137 trees greater than 6-inch dbh from the functional riparian areas of the Zigzag River and Bear Creek will be partially off-set by the replanting of 60 riparian trees. Given the riparian plantings and eventual functional riparian value of the floodplain enhancement areas, NOAA fisheries anticipates any potential short-term adverse effects from removal of the riparian vegetation will be unmeasurable and would result in long-term beneficial effects as natural revegetation occurs in the floodplain enhancement areas.

Loss of Primary Productivity.
The proposed action will likely result in a short-term reduction in primary productivity in the disturbed channel of the Zigzag River. As in-water activities such as fill and removal associated with bridge pier removal, toe trench excavation, scour protection placement, and floodplain enhancement activities disturb the channel substrate, redistribution of aquatic vegetation and benthic invertebrates will result in a temporary reduction in availability of food for rearing juvenile salmonids. NOAA Fisheries anticipates rapid recolonization of prey organisms and a return to pre-project availability of benthic invertebrates as a food source for juvenile salmonids.

Floodplain Enhancement and Stream Hydraulics.
The construction of the floodplain enhancement and the replacement bridge over the Zigzag River will decrease hydraulic constriction, create complex fish habitats, and improve general ecological connectivity such as sediment transport and large woody debris transport within the Zigzag River Watershed.

The construction of the new bridge over Bear Creek will increase the hydraulic constriction at larger than the 2-year runoff event, resulting in the potential for increased water velocities and decreased habitat complexity. The removal of the abandoned road fill and floodplain enhancement activities adjacent to, and upstream of, the new bridge are designed to attempt to offset any potential long-term adverse effects from the new bridge over Bear Creek to listed salmonids through adverse effects to salmonid habitat. Over all, long-term beneficial effects to juvenile salmonids within Bear Creek may occur as a result of habitat forming and maintaining processes such as riparian plantings, large woody debris accumulation, water quality improvements, water quantity improvements, and floodplain connectivity.

2.1.5.2 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as those effects of "future state or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation." Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being (or have been) reviewed through separate section 7 consultation processes. Therefore, these action are not considered cumulative to the proposed action.

Clackamas County has committed to improving fish passage under Lolo Pass Road by replacing the existing culverts in 2003. This action will improve access to the newly restored sections of Bear Creek. The effect of this construction has not been quantified in this document, but it will have an overall beneficial effect on the watershed baseline condition, and may or may not undergo separate section 7 consultation, depending on the existence of a Federal nexus.

NOAA Fisheries anticipates additional projects within the watershed are expected as population growth continues in the region. Associated road, residential, or commercial development, as well as maintenance and upgrading of the existing infrastructure, are therefore likely in the foreseeable future in the watershed. NOAA Fisheries assumes that these future private and state actions will continue at similar intensities as in recent years.

2.1.5.3 Interrelated and Interdependent Actions

Interrelated actions include effects from actions that are part of the larger action and that depend on the larger action for justification. Interdependent actions include those with no independent utility apart from the proposed action. Many overhead and underground utilities run adjacent to Highway 26 and the various frontage roads and may need to be temporarily or permanently moved by agents of the public or private utility owners to facilitate the proposed action. The potential for movement of these various utilities will require ground disturbance. However, these potential adverse effects are not different or beyond the scope of those analyzed in section 2.1.5.1 above .

2.1.6 Conclusion

NOAA Fisheries has determined that, based on the available information, the proposed action is not likely to jeopardize the continued existence of LCR steelhead or LCR chinook salmon. NOAA Fisheries used the best available scientific and commercial data to analyze the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects. NOAA Fisheries applied its evaluation methodology to the proposed action and found that it could cause short-term degradation of anadromous salmonid habitat due to increases in sedimentation, turbidity, loss of riparian vegetation and primary productivity, and risk of chemical contamination of the aquatic environment. Furthermore, NOAA Fisheries expects that in-water work, work area isolation, and fish removal activities could alter normal feeding and sheltering behavior of juvenile LCR steelhead and

juvenile and adult LCR chinook salmon should any be present in the action area during the proposed action. NOAA Fisheries expects some direct or delayed mortality of juvenile LCR steelhead, juvenile and adult LCR chinook salmon as a result of fish rescue, salvage and relocation activities should any be present in the action area during the proposed action.

NOAA Fisheries' conclusions are based on the following considerations: (1) Most of the proposed action will occur outside of the flowing waters of the Zigzag River and Bear Creek (*i.e.*, in the dry); (2) in-water work will occur during the preferred in-water work period of July 15 through August 31, which NOAA Fisheries expects to decrease the densities of LCR steelhead and LCR chinook salmon in the action area due to low flow condition, avoid any spawning periods or salmonid egg incubation periods; (3) any increases in sedimentation and turbidity in the project reach of the Zigzag River and Bear Creek will be short-term and minor in scale, and would not change or worsen existing conditions for stream substrate in the action area; (4) an extensive in-water work area isolation plan would be implemented to minimize potential short-term adverse effects and to avoid long-term adverse effects as a result of the proposed action; and (5) the proposed action not is likely to impair properly functioning habitat, appreciably reduce the functioning of already impaired habitat, or retard the long-term progress of impaired habitat toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.7 Reintiation of Consultation

This concludes formal consultation on the Highway 26 Zigzag to Rhododendron (Phase 2) project. As provided in 50 CFR 402.16, reintiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of authorized incidental take is exceeded, any operations causing such take must cease pending reintiation of consultation.

If the FHWA fails to provide the specified annual monitoring information, NOAA Fisheries would consider that a modification of the action that causes an effect on listed species not previously considered and would cause this Opinion to expire. Consultation also must be reinitiated 5 years after the date this Opinion is signed. To reinitiate consultation, contact the Habitat Conservation Division (Oregon Habitat Branch) of NOAA Fisheries, and refer to 2003/00536.

2.2 Incidental Take Statement

Section 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct)

of listed species without a specific permit or exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. "Harass" is defined as actions that create the likelihood of injuring listed species to by annoying it to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. "Incidental take" is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of listed species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply to implement the reasonable and prudent measures.

2.2.1 Amount or Extent of the Take

NOAA Fisheries anticipates that the actions covered by this Opinion are reasonably certain to result in incidental take of LCR steelhead and LCR chinook salmon because of potential adverse effects from increased sedimentation, turbidity, loss of riparian vegetation and primary production, risk of chemical contamination, and the potential for incidental harassment during in-water work. Handling of juvenile steelhead, juvenile chinook salmon, and adult chinook salmon during the in-water work, work area isolation, and fish removal process may result in incidental take of individuals if adequate water quantity and quality allows juvenile salmonids to be present during those activities. Based on estimates provided in the BA, NOAA Fisheries anticipates non-lethal incidental take of up to100 juvenile LCR steelhead and LCR chinook salmon and 5 adult LCR chinook salmon individuals, of which, lethal take of 10 juvenile steelhead and chinook salmon and one adult chinook salmon could occur as a result of the fish rescue, salvage and relocation activities, during the proposed action covered by this Opinion. The potential adverse effects of the other project components on population levels are largely unquantifiable and NOAA Fisheries does not expect them to be measurable in the long term. The extent of authorized take is limited to LCR steelhead and LCR chinook salmon in the Zigzag River and Bear Creek and is limited to that caused by the proposed action within the action area.

2.2.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The FHWA has the continuing duty to regulate the activities covered in this incidental take statement. If the FHWA fails to require the contractor or maintenance supervisor to adhere to the terms and conditions of the incidental take statement through enforceable terms added to the document authorizing this action, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(a)(2) may lapse.

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimize take of the above species. The FHWA shall:

1. Minimize the likelihood of incidental take from project activities by directing the contractor to use an approach that maximizes ecological functions and avoids or minimizes disturbance to the riparian and aquatic systems.

2. Minimize the likelihood of incidental take from in-water work activities by ensuring that the in-water work activities (bridge replacement) are fully or partially isolated from flowing water.

3. Complete a comprehensive monitoring and reporting program to ensure implementation of these conservation measures are effective in minimizing the likelihood of take from permitted activities.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity.

1. To implement reasonable and prudent measure #1 (project activities), the FHWA shall ensure that:

    a. Large Wood and Riparian Vegetation. Any instream large wood or riparian vegetation that is moved or altered during construction will stay on site or be replaced with a functional equivalent.
    b. Project design. Alteration or disturbance of the stream banks and existing riparian vegetation will be minimized.
    c. In-water work. All work within the active channel will be completed within the in-water work period of July 15 - August 31.
    d. Pollution and erosion control plan. A pollution and erosion control plan (PECP) will be developed for the project to prevent point-source pollution related to construction operations. The PECP will contain the pertinent elements listed below and meet requirements of all applicable laws and regulations:
        i. Measures will be taken to prevent erosion and sedimentation associated with access roads, construction sites, equipment and material storage sites, fueling operations and staging areas.
        ii. A description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.
        iii. A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on site, proposed

methods for disposal of spilled materials, and employee training for spill containment.

iv. Measures will be taken to prevent construction debris from falling into any aquatic habitat. Any material that falls into a stream during bridge replacement operations will be removed in a manner that has a minimum impact on the streambed and water quality.

e. Pre-construction activities. Before significant alteration of the action area, the following actions will be accomplished:

i. Boundaries of the clearing limits associated with site access and staging are flagged to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.

ii. A supply of erosion control materials (*e.g.*, silt fence and straw bales) is on hand to respond to sediment emergencies. Sterile straw or hay bales will be used when available to prevent introduction of weeds.

iii. All temporary erosion controls (*e.g.*, straw bales, silt fences) are in-place and appropriately installed downslope of project activities within the riparian area. Effective erosion control measures will be in-place at all times during the contract, and will remain and be maintained until such time that permanent erosion control measures are effective.

f. Earthwork. Earthwork, including in-water work and floodplain enhancement areas, are completed in the following manner:

i. Material removed during excavation will only be placed in locations where it cannot enter streams or other waterbodies.

ii. All exposed or disturbed areas will be stabilized to prevent erosion.

(1) Areas of bare soil within 150 feet of waterways, wetlands or other sensitive areas will be stabilized by native seeding,[2] mulching, and placement of erosion control blankets and mats, if applicable, quickly as reasonable after exposure, but within 7 days of exposure.

(2) All other areas will be stabilized as quickly as reasonable, but within 14 days of exposure.

(3) Seeding outside of the growing season will not be considered adequate for permanent stabilization.

g. Heavy Equipment. Heavy equipment use will be fueled, maintained and stored as follows:

i. Vehicle staging, maintenance, refueling, and fuel storage areas will be a minimum of 150 feet horizontal distance from any stream unless a specific written containment and spill prevention plan is concurred with by NOAA Fisheries in writing. Any stationary construction equiptment such as generators, cranes, or other large track mounted vehicles which cannot be

[2] By Executive Order 13112 (February 3, 1999), Federal agencies are not authorized to permit, fund or carry out actions that are likely to cause, or promote, the introduction or spread of invasive species. Therefore, only native vegetation that is indigenous to the project vicinity, or the region of the state where the project is located, shall be used.

readily moved to designated staging areas, must be in site-specific designed containment areas to avoid and minimize the risk of contamination of the aquatic environment.

ii. All vehicles operated within 150 feet of any stream or waterbody will be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired before the vehicle resumes operation.

iii. When not in use, vehicles will be stored in the vehicle staging areas.

h. Site restoration. Site restoration and clean-up, including protection of bare earth by seeding, planting, mulching and fertilizing, will be done in the following manner:

i. Disturbed areas will be planted with native vegetation specific to the project vicinity or the region of the state where the project is, and will comprise a diverse assemblage of woody and herbaceous species.

ii. No herbicide application will occur as part of this permitted action. Mechanical removal of undesired vegetation and root nodes is permitted.

iii. No surface application of fertilizer will be used within 50 feet of any stream channel as part of this permitted action.

iv. Plantings will achieve an 80% survival or 80% cover success after five years. For the purposes of this Opinion, planting success criteria will be evaluated for all plantings.

(1) If success standard has not been achieved after five years, the applicant will submit an alternative plan to NOAA Fisheries. The alternative plan will address temporal loss of function.

(2) Plant establishment monitoring will continue and monitoring reports will be submitted to NOAA Fisheries on an annual basis until site restoration success has been achieved.

2. To implement reasonable and prudent measure #2 (in-water work area activities), the FHWA shall ensure that the in-water work activities (bridge replacement) are isolated fully or, if site condition preclude full isolation, partially isolated from flowing water.

a. If the fish salvaging aspect of this project requires the use of seine equipment to capture fish, it must be accomplished as follows:

i. Before and intermittently during pumping, attempts will be made to seine and release fish from the work isolation area as is prudent to minimize risk of injury.

ii. Seining will be conducted by, or under the supervision of a fishery biologist experienced in such efforts. Staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.

iii. ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during seining and transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that

holds water during transfer, whenever appropriate, to prevent the added stress of an out-of-water transfer.

iv. Seined fish must be released as near as possible to capture sites.

v. The FHWA shall ensure that the transfer of any ESA-listed fish to third parties other than NOAA Fisheries personnel receives prior approval from NOAA Fisheries.

vi. The FHWA shall ensure that any other Federal, state, and local permits and authorizations necessary for the conduct of the seining activities will be obtained before project seining activity.

vii. The FHWA must allow NOAA Fisheries or its designated representative to accompany field personnel during the seining activity, and allow such representative to inspect the seining records and facilities.

viii. A description of any seine and release effort will be included in a post-project report, including the name and address of the supervisory fishery biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers, the means of fish removal, the number of fish removed by species, the condition of all fish released, and any incidence of observed injury or mortality.

b. If the fish salvaging aspect of this project requires the use of electrofishing equipment to capture fish, it must be accomplished as described in NOAA Fisheries' electrofishing guidelines[3].

3. To implement reasonable and prudent measure #3 (monitoring and reporting), the FHWA shall ensure that:

a. Within 120 days of completing the project, the FHWA shall ensure submittal of a monitoring report to NOAA Fisheries describing the FHWA's success meeting their permit conditions. This report will consist of the following information:

i. Project identification.

(1) Project name.

(2) Starting and ending dates of work completed for this project.

(3) The FHWA contact person.

ii. Isolation of in-water work area. All projects involving full or partial isolation of in-water work areas must include a report of any seine and release or other fish rescue and salvage activity including:

(1) The name and address of the supervisory fish biologist.

(2) Methods used to isolate the work area and minimize disturbances to fish species.

(3) Stream conditions before and following placement and removal of barriers.

[3] NMFS (National Marine Fisheries Service), *Backpack Electrofishing Guidelines* (December 1998) (http://www.nwr.noaa.gov/1salmon/salmesa/pubs/electrog.pdf).

(4) The means of fish removal.
(5) The number of fish removed by species.
(6) The location and condition of all fish released.
(7) Any incidence of observed injury or mortality.

iii. Pollution and erosion control. A summary of all pollution and erosion control inspection reports, including descriptions of any failures experienced with erosion control measures, efforts made to correct them and a description of any accidental spills of hazardous materials.

iv. Site conditions. Documentation of the finished project contours and habitat conditions.

v. Photographic documentation of environmental conditions at the project site before, during and after project completion.
(1) Photographs will include general project location views and close-ups showing details of the project area and project, including pre- and post-construction.
(2) Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.
(3) Relevant habitat conditions include characteristics of channels, streambanks, riparian vegetation, flows, water quality, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

b. On an annual basis and for 5 years following the completion the proposed action, the FHWA shall ensure submittal of an annual monitoring report to NOAA Fisheries describing the results of the FHWA's proposed site restoration and floodplain enhancement efforts and monitoring activities. This report will consist of the following information:

i. Project identification.
(1) Project name.
(2) Starting and ending dates of work completed for this project.
(3) The FHWA contact person.

ii. Site conditions. Documentation of the following conditions:
(1) The results of the site restoration and replanting success.
(2) The results of the floodplain enhancement efforts.
(3) Photo documentation of riparian vegetation and habitat conditions at each of the bridge sites and various representative locations within the project area.

Submit monitoring reports to:
NOAA Fisheries
Oregon Habitat Branch, Habitat Conservation Division
Attn: 2003/00536
525 NE Oregon Street, Suite 500
Portland, OR 97232-2778

c. If a dead, injured, or sick endangered or threatened species specimen is found, initial notification must be made to the NOAA Fisheries' Law Enforcement Office, Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; phone: 360.418.4246. Care will be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

3. MAGNUSON-STEVENS ACT

3.1 Magnuson-Stevens Fishery Conservation and Management Act

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of essential fish habitat: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem, and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50CFR600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.

- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH.

- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity

on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activity that may adversely affect EFH, regardless of its location.

3.2 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for three species of Pacific salmon: Chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based on this information.

3.3 Proposed Action

The proposed action is detailed above in section 1.2 of this document. For the purposes of this consultation, the action area is defined as the streambed, streambank, and riparian corridor of The Zigzag River, extending upstream 5 meters (m) above the confluence of Still Creek and the Zigzag River, throughout the project area, and downstream 800 m below the new Zigzag River bridge. The action area, for the purposes of this consultation, also includes the streambed, streambanks, and riparian corridor of Bear Creek, extending upstream of the new Bear Creek bridge to the Highway 26 bridge crossing, throughout the project area, and downstream 8,000 m to it's confluence with the Sandy River. This area has been designated as EFH for various life stages of chinook salmon and coho salmon.

3.4 Effects of Proposed Action

As described in detail in section 1.5 of this document, the proposed activities will result in short-term adverse effects to water quality (sedimentation, turbidity, and chemical contamination). NOAA Fisheries expects short-term adverse effects from increases in sedimentation, turbidity, and chemical contamination within the action area.

3.5 Conclusion

The proposed action will adversely affect the EFH for chinook and coho salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation measures proposed for the project by the FHWA, all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2.2 and 2.2.3 are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH recommendations.

3.7 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.8 Supplemental Consultation

The FHWA must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

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